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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/711,857	11/13/2000	Brian S. Armstrong	S1401/7007	8589
7590	12/09/2003		EXAMINER	
James H Morris Wolf Greenfield & Sacks PC 600 Atlantic Avenue Boston, MA 02210			BARTH, VINCENT P	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 12/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/711,857	ARMSTRONG ET AL.	
	Examiner	Art Unit	
	Vincent P. Barth	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 25 August 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-34,39-42 and 47-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-34,39-42 and 47-53 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>7,0102</u> . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Preliminary Comments

1. The Examiner acknowledges Applicants' election of Claims 1-34, 39-42 and 47-53 for examination. The previous Office Action did indeed contain a typographical error, in which a discussion of the restriction requirement for Claims 43-46 was inadvertently omitted. Thus, the Examiner appreciates Applicants' correct presumption that said claims belong in Group II, which was not elected. Accordingly, Applicants may wish to file one or more divisional applications derived from the instant Application.
2. Claims 24, 25, 50 and 52 contain minor typographical errors with respect to dependency. With respect to Claims 24, 25 and 50, the intended dependency is not clear from the claim language, thus the Examiner has made the following tentative assumptions merely to facilitate prosecution. Claims 24 and 25 have been construed as depending from Claim 1. Claim 50 has been construed as depending from Claim 47. Claim 52 has been construed as depending from Claim 51. Thus, in the interest of expediting prosecution, each of said claims has been discussed below as it may be best understood, using the above tentative assumptions on dependency.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first and second paragraphs of 35 U.S.C. §112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-34, 39-42, 47-50, 52 and 53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the Specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

5. Referring to Claims 1, 26, 39, 47 and 52, the italicized portion of the phrase, “orientation dependent *radiation source*” (emphasis added) does not comport with the description in the Specification. Thus, the Specification is not enabling of such claim language. For example, Figure 8 in the instant Application illustrates a “reflector” (referred to as an “Orientation Dependent Reflector”, or ODR). Therefore, Applicants have described the invention in terms of a “reflector”. Moreover, the typical and plain meaning of “radiation source” in the art is a source which generates its own radiation (i.e., incandescent bulbs, LED’s, lasers), rather than a reflector which reflects the radiation impinging upon its surface. Certainly, the instant Specification at page 43 cites two references which have a bearing on this issue: U.S. Pat. No. 5,936,723 and U.S. App. No. 09/317,052 (now U.S. Pat. No. 6,384,908), however, citing these references is not an entirely satisfactory means of addressing the underlying difficulties in the instant Application. Accordingly, alternative language must be chosen to satisfy the requirements of §112 first

paragraph. For example, “an orientation dependent electromagnetic radiation reflector”, would be an acceptable amendment to the current claim language. The Examiner would certainly consider alternatives to the example provided. The rejection under §112 first paragraph has an important bearing on the prior art search as well, since there may be a critical difference based on whether the target is truly a self-emitting light source (i.e. a directional “beacon” of sorts), or a reflector.

6. Referring to Claims 2-25, 27-34, 40-42, 48-50 and 53, the fourth paragraph of 35 U.S.C. §112 provides that, “A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers”. Accordingly, said claims inherit the §112 first paragraph rejection of the claims from which each depends, and are therefore rejected as well. However, the claims have also been discussed below, as each may best be understood.

7. Referring to Claims 1, 26, 39, 47 and 52, the underlined portion of the phrase, “at least one orientation dependent radiation source emanating from an observation surface orientation dependent radiation” (emphasis added), does not comport with the description in the Specification. Thus, the Specification is not enabling of such claim language. As discussed above, Applicants have described the invention in terms of a “reflector” rather than a radiation source which generates its own radiation. Therefore, light does not “emanate” from the target, but rather, light is reflected from the target. Accordingly, alternative language must be chosen to satisfy the requirements of §112 first paragraph. For example, “reflecting from”, would be an acceptable amendment to the current claim language to replace “emanating from”. The Examiner would certainly consider alternatives to the example provided. The claims which depend from said claims inherit the §112 rejections, as discussed above.

8. Claims 1-34, 39-42 and 47-50, 52 and 53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Referring to Claims 1, 26, 39, 47 and 52, the italicized portion of the phrase, “at least one orientation dependent radiation source emanating from *an observation surface orientation dependent radiation*” (emphasis added), renders the claims indefinite. Even in light of the rather extensive Specification, the intended meaning of the phrase is not clear. Accordingly, merely in the interest of furthering prosecution, the claims have been examined as if the phrase had been deleted, such that the limitation is essentially target which varies as a function of rotation angle and distance to the camera. The Examiner looks forward to either clarification of the phrase, preferably citing/identifying particular portions of the instant Specification, or amendments to the claim language, thus permitting a more suitable examination of the limitations proposed. The claims which depend from said claims inherit the §112 rejections, as discussed above.

10. Referring to Claim 4, the phrase, “the at least one fiducial mark includes at least four fiducial marks” is indefinite, in that one (i.e. a single) fiducial mark can not also be four fiducial marks. The Examiner suggests an alternative structure, which is: “wherein the reference target includes at least four fiducial marks”. The Examiner would certainly consider alternatives to the example provided.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claim 26 is rejected under 35 U.S.C. §102(b) as being anticipated by Schmidt, et al., U.S. Pat. No. 5,936,723 (10 Aug. 1999).

13. Referring to Claim 26, and in connection with the above discussion rejecting the claim under §112, the limitation describing a “radiation source” is construed herein to mean a reflector. Schmidt discloses an orientation dependent reflector (Fig. 1; col. 5, ln. 31), which has a plurality of retroreflecting patches 22 which produce a detectable centroid which varies depending upon the angular orientation of the object (col. 6, lns. 12-15).

14. Claim 51 is rejected under 35 U.S.C. §102(b) as being anticipated by Hsieh, et al., U.S. Pat. No. 5,719,386 (17 Feb. 1998).

15. Referring to Claim 51, Hsieh discloses an image metrology system in the context of scanning documents, and includes a reference target containing fiducial marks 10, 12, 14, 16, 19, 20, 22 and 24 (Fig. 3) which are suitable for computerized (i.e. automated) determination of the orientation of the image by the scanning means (i.e., camera) (col. 2, lns. 10-18; col. 3, ln. 29-30). Said fiducial marks provide a means for determining at least position with respect to the scanning means (i.e., camera).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 1, 39 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt, et al., U.S. Pat. No. 5,936,723 (10 Aug. 1999), in view of Forrest, U.S. Pat. No. 3,750,293 (7 Aug. 1973).

18. Referring to Claims 1, 39 and 47, and in connection with the above discussion rejecting the claim under §112, the limitation describing a “radiation source” is construed herein to mean a reflector. Schmidt discloses an orientation dependent reflector (Fig. 1; col. 5, ln. 31), which has a plurality of retroreflecting patches 22 which produce a detectable centroid which varies depending upon the angular orientation of the object (col. 6, lns. 12-15). Schmidt discloses that the angular orientation of the retroreflector (i.e. reference target) may determine the centroid of reflection, which by implication determines position of the retroreflector on the object to which it is attached (col. 2, lns. 28-30; col. 3, lns. 65-67). See MPEP §2144.01. Schmidt does not explicitly disclose that the system is a means for metrology, however, the retroreflectors are explicitly described as facilitating, “the determination of the angular orientation of an object in three dimensions.” (col. 3, lns. 59-61). Therefore, the retroreflectors may be used to determine

both the position and angular orientation of an object in three dimensions for the purposes of metrology. Schmidt does not explicitly disclose the incorporation of fiducial marks in conjunction with the retroreflectors (i.e. reference targets). Forrest discloses a system for three dimensional plotting of a scene with stereo imaging (see Figs. 1 and 3). Forrest discloses various reference targets which contain various types of fiducial marks as might be suitable for plotting (see Fig. 4; and col. 6, lns. 8-10; col. 14, ln. 22). Schmidt and Forrest are analogous art, since they are from a similar problem solving area, in that each involves reference targets used in conjunction with optical determinations from objects. See Medtronic, Inc. v. Cardiac Pacemakers, 721 F.2d 1563, 1572-1573, 220 USPQ 97, 103-104 (Fed. Cir., 1983). The motivation for combining the reference would have been to include the angular determinations of Schmidt with the fiducial marks of Forrest. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefit.

Comments

19. Enclosed with the instant Office Action are two Information Disclosure Statements which have been reviewed and signed by the Examiner. The reference entitled "Various Materials from the University of Melbourne Metrology Services" has not been initialed, since it appears not to comply with 37 CFR §1.98(b)(5), which requires that, *inter alia*, the date of publication be provided. Each page has some indication of a date created and modified, but it is not clear that such are publication dates. The Examiner realizes that such is a common difficulty with

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references provided from the Internet. Nevertheless, pursuant to the section of Rule 98 cited herein, the reference has not been officially considered, and has thus not been initialed.

Applicants may provide a rebuttal in the reply to the instant Office Action, or should withdraw the reference.

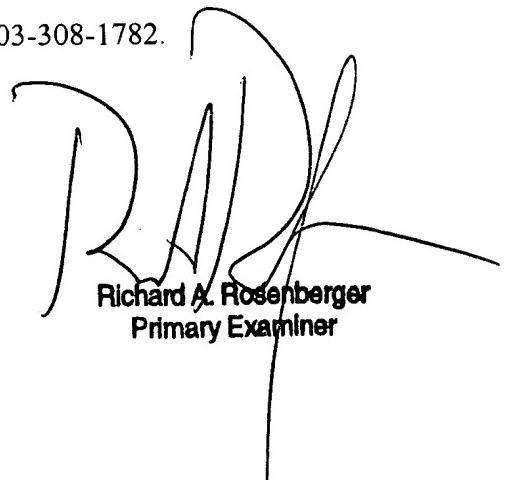
20. In connection with the instant Application, Applicants have obtained a foreign filing license in the year 2001 from the U.S. Patent Office. If any references and/or search reports provided by any foreign patent offices during the examination process therein have been made available to Applicants or Applicants' Counsel, Applicants are reminded that these may be considered relevant to the Examiner in the U.S. Patent Office, and must be submitted. See MPEP §2001.06(a), citing Gemveto Jewelry Co. v. Lambert Bros., Inc., 542 F.Supp. 933, 216 USPQ 976 (S.D.N.Y., 1982), and citing 37 CFR §1.56. Accordingly, any such references or search reports must be submitted to the Examiner at the U.S. Patent Office before prosecution closes, or preferably concurrently with Applicants' reply to the instant Office Action. Any search reports would be particularly relevant, since the relevant portions of the references would likely be identified. Moreover, if any other references are known by Applicants to be relevant, whether patent references or non-patent literature, these references should be submitted as well. Translations of documents are not necessary, but would certainly expedite prosecution of the instant Application.

21. Finally, the instant Specification at various points (for example: page 1, last paragraph; and page 36, first paragraph), states that the instant invention does not require multiple viewing angles to generate the three-dimensional shape of objects. However, as an example using perhaps the simplest of geometrical objects, a rectangular block, it would seem that the target in

the instant invention would not provide depth-dimensional information when using a single photo or a single lens when viewed from a line of sight directly normal and along a centerline of such object. It would seem that in any scene analyzed, even with the system proposed, some objects could not yield depth information at certain angles, without having multiple photos from different angles or multiple lenses at different angles. Commentary from Applicants on this issue, including citations from portions of the instant Specification if possible, would be useful to the prosecution of the instant Application.

CONCLUSION

22. Applicants' Claims 1-34, 39-42 and 47-53 are rejected based on the reasons set forth above.
23. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 703-605-0750, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. The fax number for the group before final actions is 703-872-9306.
24. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Frank G. Font, who may be reached at 703-308-4881.
25. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Richard A. Rosenberger
Primary Examiner